

ANNUAL REPORT

1962-1963

MUSEUM OF
COMPARATIVE ZOOLOGY

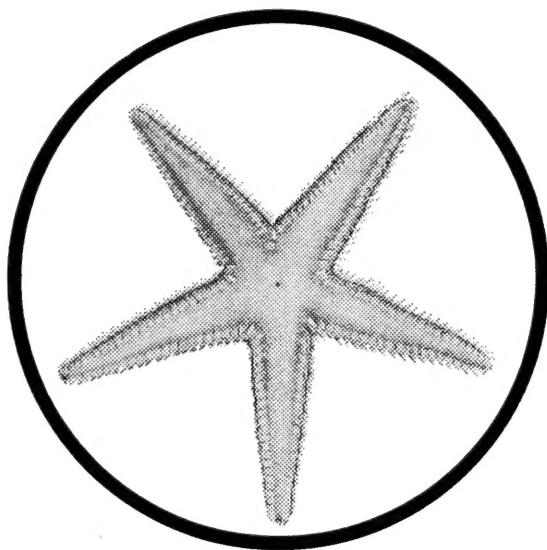


HARVARD UNIVERSITY

ANNUAL REPORT

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MUSEUM OF COMPARATIVE ZOOLOGY



Astropecten aurantiacus L. Drawn by J. Burkhardt, 1837.

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MUSEUM OF COMPARATIVE ZOOLOGY

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MUSEUM OF COMPARATIVE ZOOLOGY

REPORT OF THE DIRECTOR

Reporting on the Museum's activities of the past year gives me again a welcome opportunity to focus attention on the objectives of a modern university museum.

Such a museum is devoted to instruction and research, and these two areas are exactly where the strength of the MCZ lies. We are one of this country's strongest graduate schools in systematic and evolutionary biology, and we produce an annual crop of well trained taxonomists, morphologists and evolutionists. Further details on this are reported below under Teaching.

The role of the MCZ as an idea center is nationally and internationally recognized and reflected not only in the staff bibliography (appended) but also in the great number of invitations received by staff members to lecture at universities and congresses and to participate in symposia and conferences.

Nothing could be more misleading than to think of the MCZ merely in terms of its exhibits and collections. To be sure, our famous collections and exhibits form an indispensable foundation for research and instruction, but the real greatness of the MCZ results from the quality of its staff. It is these scientists who make use of the collections and derive from them, and from the study of living nature, a new understanding of nature. Furthermore, it is their task to convey this knowledge to our students, the next generation of scientists. Research and instruction, as in all university museums, is the indivisible objective of the scientific staff.

STAFF

Worth noting are several changes in title of staff members: Dr. Philip J. Darlington, Jr., Curator of Recent Insects, was appointed Alexander Agassiz Professor of Zoology, and Dr. Bernhard Kummel, formerly Associate Curator, was appointed Curator of Invertebrate Paleontology.

New associates include: Gordon Gates, Invertebrates; Robert Gibbs, Jr., Ichthyology; James Greenway, Jr., Ornithology; Donald Griffin, Zoology; Joseph Hazel, Invertebrate Paleontology; Norman Marshall, Ichthyology; Rosendo Pascual and Leonard Radinsky, Vertebrate Paleontology.

Maxwell French, the most knowledgeable and best known member of the MCZ staff, has retired after thirty-five years of indispensable service. We shall all miss him.

Dr. Merrill E. Champion, Associate in Mollusks, died in June after a short illness. Since 1935 he had served as a devoted volunteer worker in the Department of Mollusks.

The Director was made an honorary member of La Sociedad Venezolana de Ciencias Naturales and of Societas Scientiarum Fennica (Helsingfors), and is serving as Chairman of Panel 4 of the U.S.-Japan Scientific Cooperation Committee, sponsored by the National Science Foundation.

Professor Simpson received the Darwin Medal of the Royal Society of London, was elected President of the American Society of Zoologists, a foreign member of the Accademia Nazionale dei Lincei in Rome—oldest scientific academy in the world—and a foreign member of the Argentine Academia Nacional de Ciencias. Professor Romer received the Hayden Memorial Geological Award, the Penrose Medal of the Geological Society of America, served as President of the XVI International Congress of Zoology, and was elected a foreign member of the Argentine Academia Nacional de Ciencias. Professor Patterson was elected to membership in the National Academy of Sciences. Dr. Tilly Edinger is President-elect of the Society of Vertebrate Pale-

ontology and was elected an honorary member of Paläontologische Gesellschaft. Dr. Mead is now serving as Editor-in-Chief of "Fishes of the Western North Atlantic." Many members of the staff serve on editorial boards and committees, and collectively hold numerous offices in various societies.

TEACHING

The scientific staff gave the following courses: Biology 127 (Carpenter), Biology 130 (Mead), Biology 131 (Lyman), Biology 149ab (Levi), Biology 248 (Mayr and Simpson), Geology 151 (Whittington), Geology 153 (Patterson), Geology 155 (Whittington), Geology 258 (Whittington and Kummel). In addition, research courses were offered by Carpenter, Clench, Darlington, Miss Deichmann, Kummel, Miss Lawrence, Lyman, Mayr, Mead, Patterson, Romer, Simpson, Whittington, Williams.

Individual lectures by staff members were also given in various undergraduate courses such as Natural Sciences 5, Natural Sciences 10, and Biology 246.

The following students, doing their basic research in the Museum, were awarded PH.D. degrees: Kenneth Boss, Zeddie Bowen, Doris Burda, Robert Carroll, John Chase, Nathan Hart, Jonathan Swinchatt, Thomas Szekely, Lily Tashima, Charles Taylor, Keith Thomson.

More than thirty graduate students were supervised by staff members during the academic year. This year, graduate student teas were held for the first time, under the able guidance of Dr. Ruth Turner.

EXPEDITIONS AND TRAVEL

Field research took students and staff to all corners of the world—Chile, Cook Islands, Curacao, Dutch Guiana, Ecuador, Guadeloupe, Haiti, Italy, Lesser Antilles, Mexico, Venezuela, Yugoslavia, and to many of the states, such as

California, Florida, Kansas, Oklahoma, Tennessee, Texas, Virginia and Wyoming.

Collections were studied at natural history museums in Britain, France, Vienna and Basel, and at the universities of Vienna, Zürich, Bonn and Tübingen. Grateful acknowledgment is made to the National Science Foundation and to the National Institutes of Health. Funds from these sources made possible much of the above-mentioned field work and study.

The MCZ was represented at many symposia and international meetings, including the Wenner-Gren Symposium on Classification and Human Evolution (Professors Mayr and Simpson), Second International Symposium on Mammalian Hibernation (Dr. Lyman), Fiftieth Anniversary Meeting of Paläontologische Gesellschaft (Dr. Edinger), and the Third International Meeting of Neurobiologists (Dr. Edinger).

RESEARCH

The extensive and diversified research of more than twenty staff members can only be highlighted here. Ultimate objectives are to clarify the pathways of evolution and to determine the forces and mechanisms responsible for these evolutionary changes.

Taxonomy

Sound taxonomy is the indispensable foundation of all such research and it is gratifying, therefore, that basic taxonomy has occupied much of the time of all staff members and that their studies have resulted in the completion or appreciable advancement of numerous revisions and monographs.

Professor Romer is now completing revision of his "Vertebrate Paleontology" and has continued studies of South American Triassic reptiles and of various Paleozoic amphibians and fishes. Professor Carpenter is in the midst of a com-

plete revision of fossil insects for the insect volume of the Treatise on Invertebrate Paleontology. Supplementing this work he studied the systematics of a number of primitive Permian and Carboniferous genera, these studies leading to the description of some strikingly new types.

Dr. Evans continues his analysis of the wasp family Bethylidae. Revision of the key genus *Apenesia* (about 70 American species) has been completed and a conspectus of the twenty-five genera of the family is concluded. Dr. Levi's study of the extremely large spider family Theridiidae is progressing; he has essentially completed the treatment of the South American species as far as available in collections. This is the first time an attempt has been made to re-examine all the types and to describe not only new species but also to redescribe those that are poorly characterized. His keys, maps and extensive illustrations form a new basis for future work on this family.

The mysterious "New England canids" continue to be Miss Lawrence's prime concern and she has initiated studies of their behavior, chromosomes and blood proteins in collaboration with other interested investigators. Dr. Paynter has completed the first part of a series of revisions of South American Emberizinae which will in part serve as a basis for his monographic treatment of this subfamily for the Check-List of Birds of the World. Dr. Williams and his associates are undertaking large series of revisionary studies with particular emphasis on the lizard genus *Anolis* and its remarkable adaptive radiation in the West Indies. These studies also include numerous other genera such as the lizards *Sphaerodactylus* and *Ameiva*. Dr. Laurent, Research Herpetologist, has completed revisions of the African *Typhlops*, of turtles of the genus *Pelusios*, of the snake *Lycophidion*, and the frog *Hemisus*.

Dr. Mead has concentrated on the identification and taxonomic analysis of larvae and juveniles of specific forms of the oceanic family Bramidae. Some of his findings may

be of considerable importance to commercial fisheries. A review of seahorses for the "Fishes of the Western North Atlantic" is being prepared by Mrs. Dick, and Mr. Schroeder has reviewed the whittings (*Merluccius*) for this same publication. Dr. Clench completed two monographs in the Johnsonia series dedicated to the marine mollusks of the Western Atlantic; one deals with the genus *Pedipes*, the other with the South American Volutidae.

Dr. Whittington's taxonomic analysis of the Ordovician trilobites of Wales and of Newfoundland has resulted in descriptions of more than fifty new species and a considerable number of new genera. Dr. Kummel is working on a complete revision of the ammonites of the Lower Triassic, which has necessitated not only field work in the Salt Range in India and in other places, but also visits to many museums in Russia and in Western Europe to study types and critical faunas not represented in American museums.

Faunistics and Stratigraphy

Many of these taxonomic studies are at the same time studies of the faunas of specific areas or geological horizons. Other faunistic research carried out by the staff includes the following: by Paynter, on the birds of Flores in the Lesser Sunda Islands; by Williams, on the herpetofauna of Bougainville in the Solomon Islands; by Williams and Gans, on Somalia; by Laurent, on the Itombwe Highlands of the eastern Congo (with a remarkable endemic amphibian fauna) and on smaller or larger collections of various other parts of Africa; by Evans on North American wasps of the family Pompilidae. He has mapped the distributions of 130 species in 23 genera and worked out precisely the northern limits of tropical and southern limits of temperate species. Dr. Clench has started to study a large new collection of land and freshwater mollusks from the Bismarck Archipelago and he is continuing his study on the freshwater mollusks of Georgia. Patterson and his associates

have described a remarkable Tertiary fauna from Mendoza in Argentina that contains an unexpected large number of animals unknown elsewhere on the continent.

Zoogeography

The broader aspects of zoogeography attracted the attention of several members of the staff. Dr. Mayr attempted to draw inferences on the Tertiary distribution of North and South American types of birds from the subsequent radiation of numerous families in the various parts of the Americas. He also completed, in joint authorship with William Phelps Jr., an analysis of the bird-fauna in the highlands between Venezuela, British Guiana and Brazil and of the derivation of this fauna. Dr. Williams continued his studies of the faunal history of the remarkable lizard genus *Anolis*. A series of collecting parties working in various parts of the Greater and Lesser Antilles have produced considerable new material clarifying, and in some cases complicating, a previous picture of the radiation of this group. Dr. Kummel is well advanced into the ambitious project of a detailed reconstruction of the earth's history during a limited geological age, the Lower Triassic (Scythian stage). The principal basis of this analysis is a complete revision of the ammonites of this period. Dr. Whittington is doing an evolutionary and zoogeographic study of the trilobites of the Ordovician, particularly the middle Ordovician, based primarily on his field work and analysis of the faunas of Newfoundland and Wales. Finally, Dr. Darlington is working on a synthesis of knowledge of the faunas at the tips of the southern continents. His personal field work in Tasmania in 1956-1957, and in Tierra del Fuego in 1962-1963, is of the greatest value in interpreting the recent flood of geological and botanical literature bearing on the history of southern continents. Means of dispersal and the possibility of no longer existing land connections will receive special consideration in this synthesis.

Anatomy and Morphology

Anatomical-morphological studies were undertaken by Dr. Romer (Paleozoic amphibians and sharks), Dr. Edinger (brain, pituitary, and nerves of fossil mammals), and Dr. Evans (morphology of larval structures in the digger wasps [Sphecidae]). Dr. Turner's studies of the anatomy of the shipworms (Teredinidae) and of the Volutidae have shed much new light, not only on the functional anatomy of these forms, but also on the basic classification of the families to which they belong.

Physiology and Population Biology

Studies of mammalian physiology are being continued by Dr. Lyman, particularly the physiology of hibernation. Application of new experimental techniques such as use of various drugs and radioactive tracers, permits new insights not possible with purely observational methods.

Dr. Paynter continued his analysis of population turnover in natural colonies of Herring Gulls and he completed a series of "life tables" for birds banded in given years.

Behavior

The study of animal behavior has attracted the attention of various staff members. Dr. Evans has completed about half of a major work on the comparative ethology and evolution of the sand wasps (Nyssoninae). This is largely an attempt to understand the origins of the highly evolved structure and behavior of *Bembix* and related genera. Dr. Levi continued his studies of the Black-widow and other poisonous spiders. Dr. Mayr suggested the reclassification of a number of genera of Australian birds on the basis of their behavior pattern. Dr. Mead and his associates are engaged in a major project dealing with the sexual biology of deep sea fishes. Particular attention will be paid to the control of the season of reproduction, sex recognition in total darkness, and on mechanisms to facilitate the survival

of the young. The extremely hostile environment of the very cold, dark waters of the deep sea with its enormously impoverished animal life and reduced food sources makes such biological studies particularly intriguing.

General Systematics and Biological Concepts

Dr. Mayr completed two papers dealing with the methods and theory of systematics and with an evaluation of new taxonomic methods. He attempted to apply the thinking of the new systematics to the classification of fossil hominids, thus permitting a simplification of their classification and a more precise definition of various open problems. Dr. Simpson studied various aspects of scientific philosophy during the past year. Among subjects specifically studied were: (1) non-predictive theories, the explanation of unique events, the nature and study of historical science; (2) reconsideration of so-called exobiology and of the chances of communication with beings elsewhere in the universe; (3) critique of some mystical approaches to evolutionary-philosophical problems, and a discussion of alternatives to them. A volume of essays was completed on these and related topics.

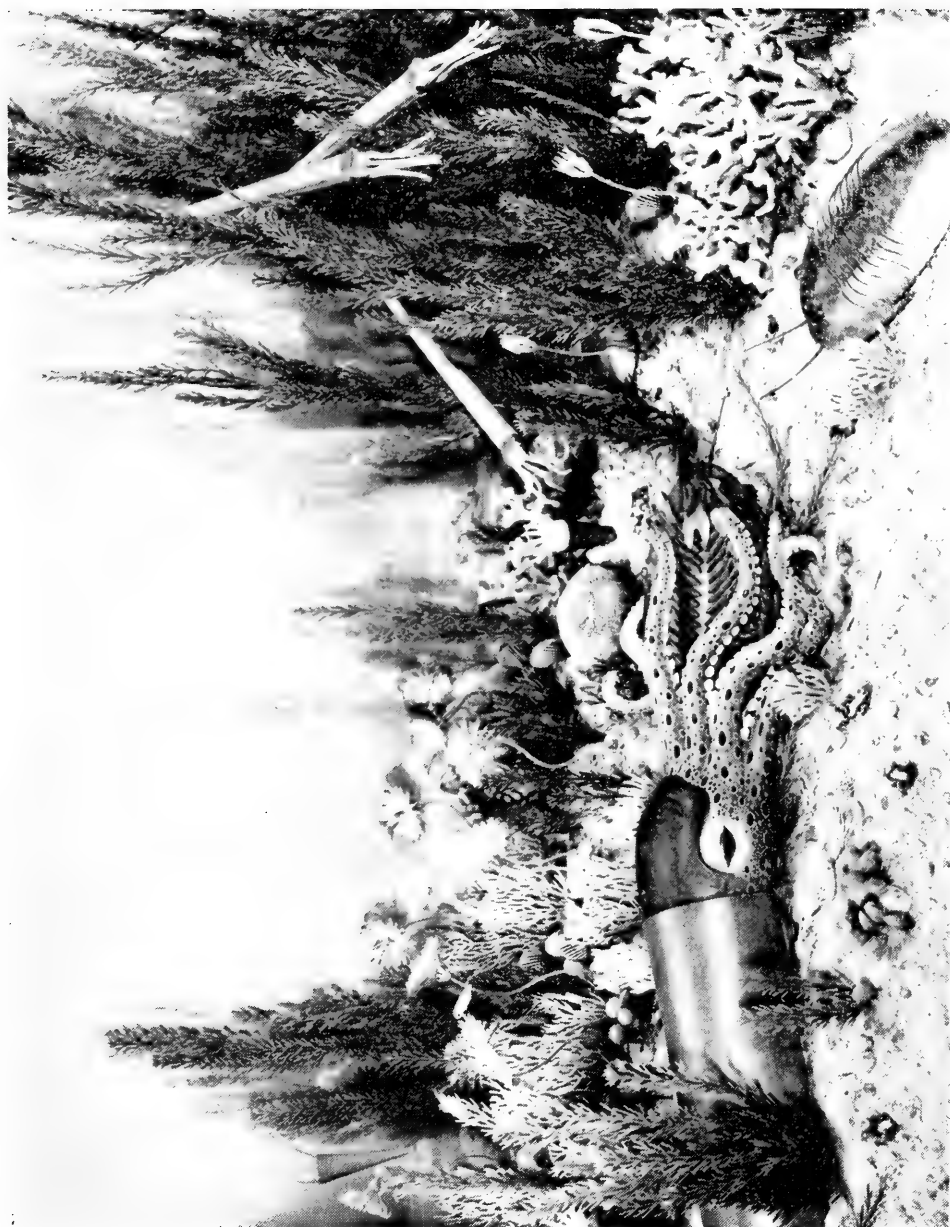
This cursory survey of research at the MCZ gives some indication of the breadth of interest displayed by the staff. It does not mention research of the numerous graduate students nor the activities of the staff in reviewing books and in popular writing, some of which is reflected in the attached bibliography.

PUBLICATIONS

Publications of finished research include some 90 titles and approximately 4,580 pages. Among the more extensive efforts were the two-volume, *Bibliography of Fossil Vertebrates Exclusive of North America* (Romer, Wright, Edinger, Van Frank), and Dr. Mayr's *Animal Species and Evolution*. Museum publications under the editorship of Miss Wright



The shallow sea floor in the tropical Pacific. Photo taken during the Fanning Island Expedition, 1963, in which Dr. W. Newman of our MCZ staff was a participant.



Reconstruction of a shallow sea floor of the Ordovician Period (450 million years ago) based on fossils found near Cincinnati, Ohio. Presented by Mrs. Henry C. Stetson and family in memory of her husband, for many years Research Oceanographer at MCZ.

totalled 1398 pages, and included the "Bulletin" (Volume 127, No. 4 through Volume 129, No. 7) and 26 numbers of "Breviora." The Department of Mollusks published one issue of *Johnsonia*, and the MCZ sponsored publication of several papers in *Psyche*. Details of all publications are recorded in the appended bibliography.

COLLECTIONS

Departmental collections were again substantially augmented by field trips. The James Chapman collection of Philippine ants has now been incorporated. These valuable specimens survived the Japanese occupation of the Philippines in hollow trees. The Mollusk Department's teredinid (shipworm) collection was greatly increased by material gathered from test boards all over the world. Additional test boards are being placed in many new localities, including sites in South America and the British Commonwealth.

LIBRARY

Our Librarian, Miss MacKenzie, reports that the Library has increased its holdings by 4,054 volumes and pamphlets, bringing the total number up to 253,600. An outstanding acquisition was the notebook kept by Louis Agassiz when he was a seventeen-year-old student at the University of Zürich. Fifty-two new exchanges were arranged, adding 86 new titles to the Library's serial holdings.

EXHIBITS AND MUSEUM SHOP

The Museum Shop continues to be a popular MCZ asset, providing modest amounts of money for the improvement of our exhibition halls. A new fossil invertebrate hall is at present in the planning stage. A very interesting and colorful diorama of an Ordovician sea bottom was added to our

displays and it is hoped that a similar diorama of another geological period can be secured. While elaborate exhibits and dioramas are not in keeping with our exhibit policies, it is felt that these dioramas are an exception in that they "bring to life" material that is completely unfamiliar to the average student. He can form a mental image of a dinosaur from a mounted skeleton, since it is not really very different from familiar vertebrates seen daily, but there is difficulty in imagining, for example, how a living trilobite may have appeared.

ACKNOWLEDGMENTS

We are grateful to our many interested friends and associates who have made valuable additions to our collections, have voluntarily given of their time, and have made significant contributions to our resources.

We are particularly indebted to the following:

For major additions to our collections—Joseph C. Bequaert, Arthur M. Chickering, Richard W. Foster, Richard I. Johnson, Arthur S. Merrill, Thomas Monath, Fred Parker, J. A. Hager, Frank B. Smithe, Ronald P. Tripp, Bernard Tursch.

For volunteer help—Mrs. Barbara S. Crowley, W. T. M. Forbes, Mrs. Bette A. Rachlin, Mrs. E. U. Ritter, Deborah Ritter, Henry D. Russell, Karen Wolfsberg.

For contributions to our resources—Sidney A. Hessel, Alvin Lothrop Luttrell, Henry D. Russell, Mr. and Mrs. Hermon D. Smith, Frank B. Smithe, Mrs. Henry C. Stetson (for continuation of work on the memorial exhibit to Henry C. Stetson), Boston Malacological Club.

For contributions to our Library—Professor Banareseu, Joseph C. Bequaert, Henry B. Bigelow, Frank M. Carpenter, Sang Choe, William J. Clench, Richard W. Coleman, Philip J. Darlington, Jr., Elisabeth Deichmann, Tilly Edinger, Frank N. Egerton, Henry Field, W. T. M. Forbes, Richard W. Foster, Carl Gans, James C. Greenway, Jr., Winthrop

P. Haynes, David O. Hill, Richard I. Johnson, Herbert W. Levi, Gunnar W. Lundberg, Charles P. Lyman, Jessie Bell MacKenzie, A. E. Maynard, Ernst Mayr, Giles W. Mead, J. P. Portman, Alfred S. Romer, Emile Schaub-Koch, William E. Schevill, George C. Shattuck, Jeff Warner, Harry B. Whittington, Ernest E. Williams, Edward O. Wilson, American Museum of Natural History, National Science Foundation, Royal Society of London, University of Paris, U.S. National Museum.

In addition, we acknowledge our thanks to the following for various other donations:

Richard H. Backus, Arthur C. Borrer, Donald G. Broadly, Michael Churkin, Stanley Cobb, Michael W. Dix, Murray Gardler, Mrs. Franklin Hammond, David O. Hill, Norman P. Hill, Jonathan Leakey, David B. Legters, Arthur Loveridge, James Morris, John L. Motley, Jr., David W. Norton, R. A. Philippi, E. L. Riker, Albert Schwartz, W. Taylor, George Theokritoff.

It is especially gratifying to be able to report on the close cooperation between this Museum and the Woods Hole Oceanographic Institution. The latter has made space available to MCZ ichthyologists in the recently completed Laboratory of Marine Science, and the magnificent material gathered by the Institution's expeditions is under active study. Much of this material will become part of our collections, and its value, both for research and for student training, cannot be overstated. This collaboration has provided opportunities unexcelled by any other American university. To Dr. Paul Fye, Director, to Dr. Richard Backus and others, goes our grateful appreciation.

ERNST MAYR
Director

PUBLICATIONS FOR THE YEAR

1962-1963

BREVIORA

- No. 161. A comparative study of the respiratory muscles in Chelonia. By R. V. Shah. 16 pp. 12 figs. July 16, 1962.
- No. 162. Australian carabid beetles X. *Bembidion*. By P. J. Darlington, Jr. 12 pp. 1 fig. July 25, 1962.
- No. 163. New worm-lizards (*Ancylocranium* and *Amphisbaena*) from southeastern Tanganyika Territory. By Arthur Loveridge. 6 pp. July 26, 1962.
- No. 164. Notes on the herpetology of Hispaniola. 7. New material of two poorly known anoles: *Anolis monticola* Shreve and *Anolis christophei* Williams. By Ernest E. Williams. 11 pp. 2 figs. August 22, 1962.
- No. 165. An extinct solenodontid insectivore from Hispaniola. By Bryan Patterson. 11 pp. 4 figs. August 22, 1962.
- No. 166. Lectotypes of species of Ogcocephalidae selected from syntypes in the Museum of Comparative Zoology. By Margaret G. Bradbury. 4 pp. Sept. 5, 1962.
- No. 167. *Bathyclupea schroederi*, a new bathyclupeid fish from the western tropical Atlantic. By Myvanwy M. Dick. 4 pp. 1 fig. Sept. 5, 1962.
- No. 168. Two new species of fossil talpid insectivores. By Katherine M. Reed. 6 pp. 1 pl. Sept. 7, 1962.
- No. 169. New records of inshore fishes from the Atlantic Coast of Panama. By Ira Rubinoff and Roberta W. Rubinoff. 7 pp. Oct. 15, 1962.
- No. 170. The brain of the emu (*Dromaeus novaehollandiae*, Lath) 1. Gross anatomy of the brain and pineal body. By Stanley Cobb and Tilly Edinger. 18 pp. 4 figs. Nov. 16, 1962.
- No. 171. Notes on amphisbaenids (*Amphisbaenia*; Reptilia). 6. Redescription and range extension of *Amphisbaena spurrelli* Boulenger. By Carl Gans. 11 pp. 8 figs. Dec. 14, 1962.

- No. 172. A new species of the rodent *Pipestoneomys* from the Oligocene of Nebraska. By Raymond Alf. 7 pp. 3 figs. Dec. 14, 1962.
- No. 173. New species of land mollusks from the República Dominicana. By William J. Clench. 5 pp. 1 pl. Dec. 24, 1962.
- No. 174. A new arctocyoniid from the Paleocene of Wyoming. By Bryan Patterson and Paul O. McGrew. 10 pp. 3 figs. Dec. 24, 1962.
- No. 175. A picrodontid insectivore(?) from the Paleocene of Wyoming. By Paul O. McGrew and Bryan Patterson. 9 pp. 2 figs. Dec. 24, 1962.
- No. 176. On the races of *Kinixys belliana* Gray. By R. F. Laurent. 6 pp. Dec. 27, 1962.
- No. 177. Rhipidistian classification in relation to the origin of the tetrapods. By Keith S. Thomson. 12 pp. 1 pl. Dec. 27, 1962.
- No. 178. On a new species of the earthworm genus *Trigaster* Benham 1886 (Octochaetidae). By G. E. Gates. 4 pp. Dec. 27, 1962.
- No. 179. The holothurians of Clipperton Island in the eastern tropical Pacific. By Elisabeth Deichmann. 5 pp. Jan. 16, 1963.
- No. 180. A new fresh-water amphipod crustacean from Oregon. By E. L. Bousfield. 6 pp. 2 figs. Jan. 17, 1963.
- No. 181. Systematic notes on the land snails of the genus *Tomocyclus* (Cyclophoridae). By Fred G. Thompson. 11 pp. 1 pl. 1 fig. Feb. 1, 1963.
- No. 182. Birds from Flores, Lesser Sunda Islands. By Raymond A. Paynter, Jr. 5 pp. Feb. 1, 1963.
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